BIOLOGICAL EVALUATION of The Mountain Pine Beetle in Lodgepole Pine Ditch Creek Bridger-Teton National Forest - 1973

BIOLOGICAL EVALUATION

Mountain Pine Beetle in Lodgepole Pine
Ditch Creek
Bridger-Teton National Forest[1/]
Wyoming

1973

INTRODUCTION

The mountain pine beetle continues to kill lodgepole, whitebark and limber pine throughout portions of the Bridger-Teton National Forest in western Wyoming. The present infestation is the aftermath of a longstanding outbreak that swept through most of the lodgepole pine type in the Bridger and Teton National Forests and Grand Teton National Park during the 1960's. Suppression mainly by chemical treatment of individual trees and to a considerably lesser extent by logging, was undertaken in much of the infestation from 1961 to 1968.

The area around Antelope Point and in portions of Ditch Creek was treated yearly by the individual tree method from 1961 through 1966. By 1967, the infestation in Ditch Creek was at a low enough level that suppression was terminated. Once suppression was stopped, tree killing increased and has since spread into susceptible stands to the south and east.

GENERAL INFORMATION

INSECT: Mountain pine beetle, Dendroctonus ponderosae Hopkins.

HOST TREE: Lodgepole pine, Pinus contorta Dougl.

LOCATION: Portion of Gros Ventre Ranger District, Bridger-Teton National Forest, Wyoming.

TYPE OF DAMAGE: Killing of lodgepole pine.

EXTENT OF DAMAGE: Lower reaches of the Gros Ventre River from Spread Creek in the north, south to Sheep Mountain, and east to Green Mountain (see appended map).

1/ Formerly separate Forests: Bridger and Teton.

METHODS

An aerial reconnaissance of the infestation has been made each year since the infestation began, but records prior to 1965 are sketchy. An on-the-ground evaluation survey was conducted in the Ditch Creek Area during October 17 and 18, 1973. Attack ratio surveys were conducted in two areas. Affected trees were counted, differentiated as to year of attack (1972 and 1973), and their diameters measured and recorded. General observations were made as to the stages of the insect, their relative abundance and condition; and the presence and general abundance of natural enemies; namely, parasites and predators.

The remnants of past control projects still exist in the area; chiefly, tagged trees and string lines. The dates on the treated trees were not legible, however. Many of the largest diameter trees in the stand were dead. Since most of them contained the remains of treatment tags, they were probably killed between 1961 and 1966.

BIOLOGICAL INFORMATION

Previous studies[2/] have shown that during a mountain pine beetle epidemic in lodgepole pine, the larger trees are killed first, and they are killed in an amount disproportionate to their occurrence in the stand. It is logically assumed that during the early stages of an outbreak, new/old attack ratios are weighted to the new attacks. The results of the 1973 Ditch Creek evaluation survey follow:

FIGURE 1

Area	Number of Attacks 1973	Number of Attacks 1972	Attack Ratio[3/]	Ave. DBH[4/] 1973	Ave. DBH[4/] 1972	Brood Cond.	Infestation Intensity	Trend
1	31	77	0.4:1	11.4	12.7	Good	Moderate	Decreasing
2	36	63	0.6:1	12.0	13.2	Good	Moderate	Decreasing

3/ Ratio of new (1973) attacks to old (1972).
4/ Weighted averages

In both areas, old attacks (1972) exceeded the new attacks (1973), indicating a declining trend. As further evidence of this trend, Figure 1 shows that in both areas, the mean diameter of the newly infested trees is considerably smaller than those trees attacked and killed in 1972.

2/ Parker, Douglas L. 1973. Trend of A Mountain Pine Beetle Outbreak. Journal of Forestry. In Press.

Brood stage was mostly eggs and young larvae, and there was very little evidence of an effective level of parasites and predators.

Tree mortality is inversely proportional to elevation; i.e., stands at the lower elevations (7,100 feet) were more heavily attacked than those at higher elevations (9,000 feet). The preponderance of new attacks are at the higher elevations, and the infestation in the lower reaches of Ditch Creek will continue, but at a declining rate.

DISCUSSION

It is unfortunate that the opportunity for capitalizing on the momentary gains made in Ditch Creek were never realized. Heavy tree losses inevitably occurred. The only apparent change was to extend the life of the infestation. Once treatment stopped, the infestation intensified in place and has now spread to most of the surrounding drainages. It is likely that the infestation will continue to move through most of the susceptible host type in the Gros Ventre drainage. In Ditch Creek, however, particularly in the lower reaches that are not included in the inventoried roadless area, the peak of the infestation has been reached. Additional trees will die next year, and the year after, but at a reduced rate.

Impact studies have shown that losses in lodgepole pine can vary anywhere from 10 to 50 percent of the trees in the stand and upwards of 50 to 70 percent of the merchantable volume. With due consideration of existing mortality, of residual stand structure, and elevation, it is doubtful that losses will exceed 30 percent of the stand. Most mortality will be in the larger diameter trees.

RECOMMENDATIONS

The one remaining solution to the mountain pine beetle situation in Ditch Creek and other operable infested areas is timber harvesting. The infestation has been in progress too long and is too extensive for logging to have any suppression effect, but harvest will not only utilize a resource that would otherwise be lost, but also convert the already damaged stands to a less susceptible state.

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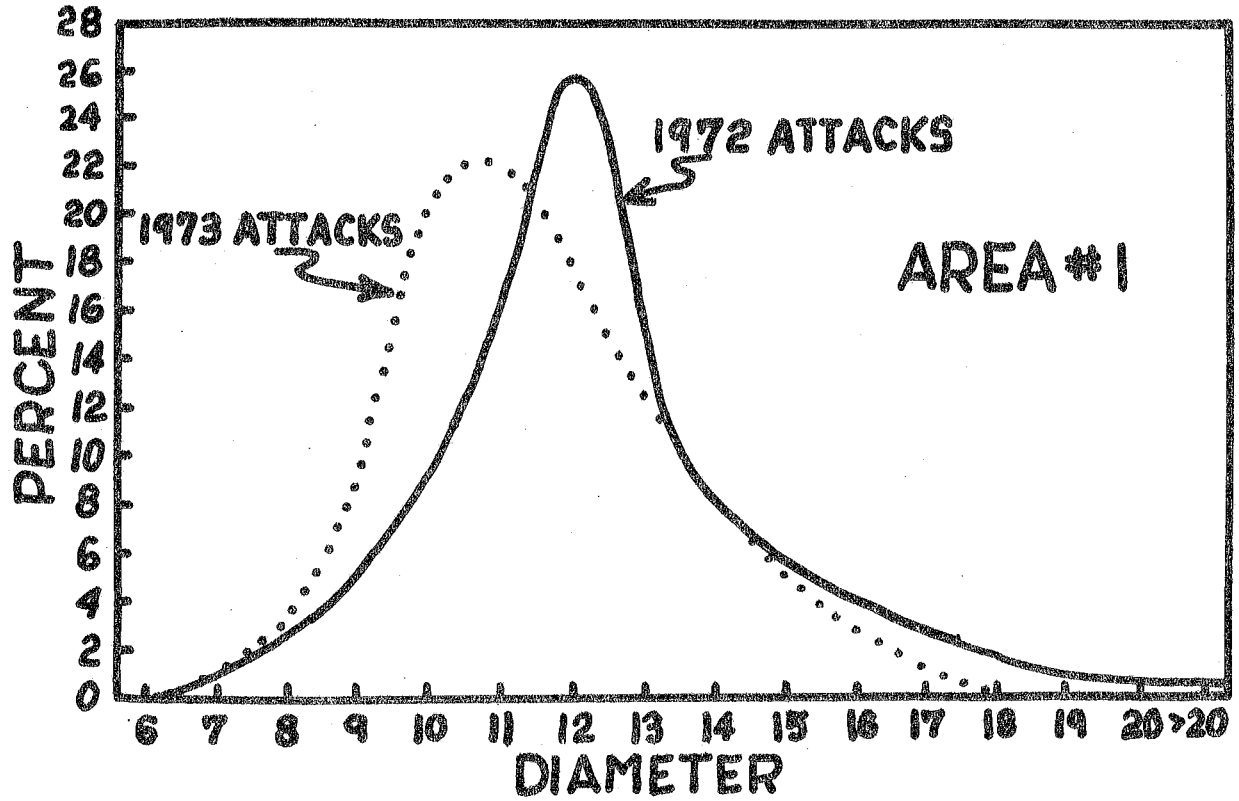
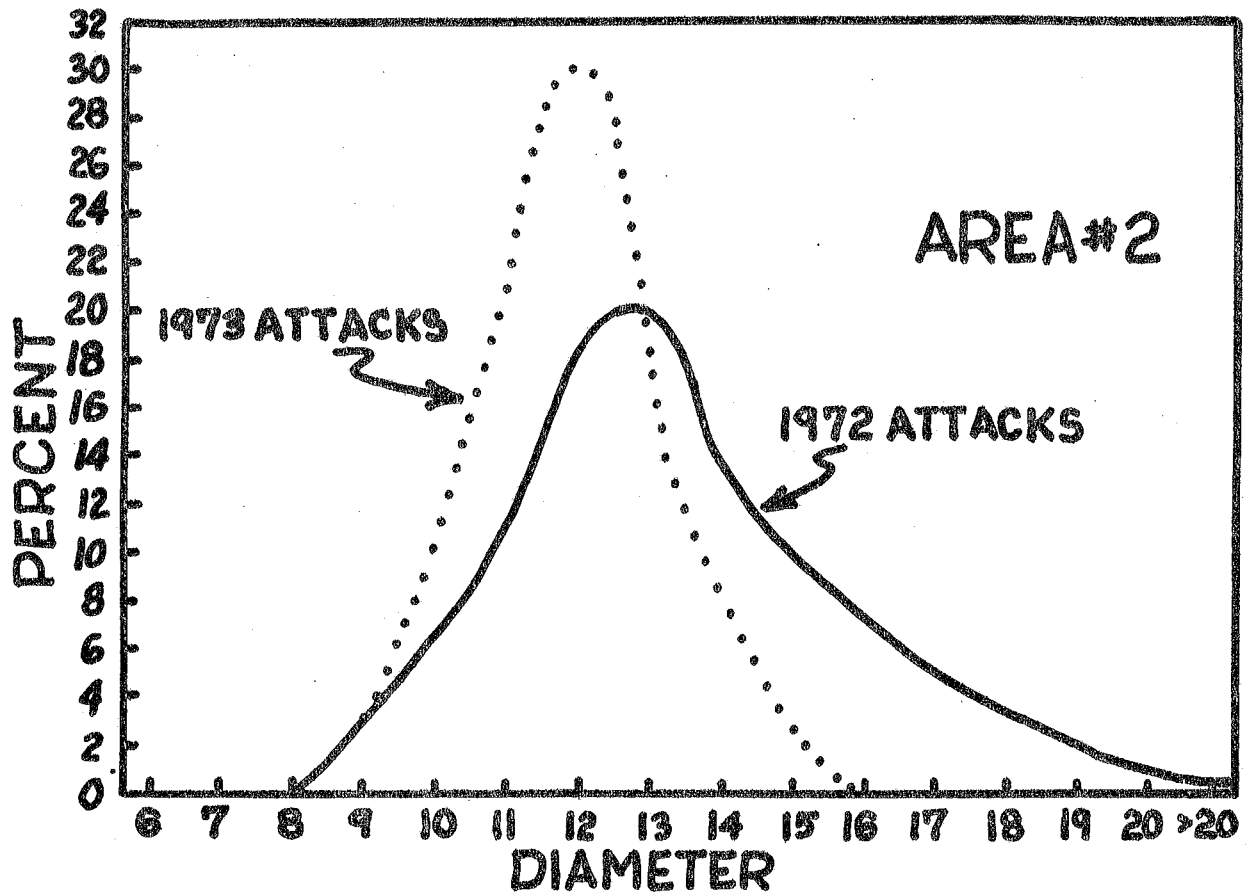
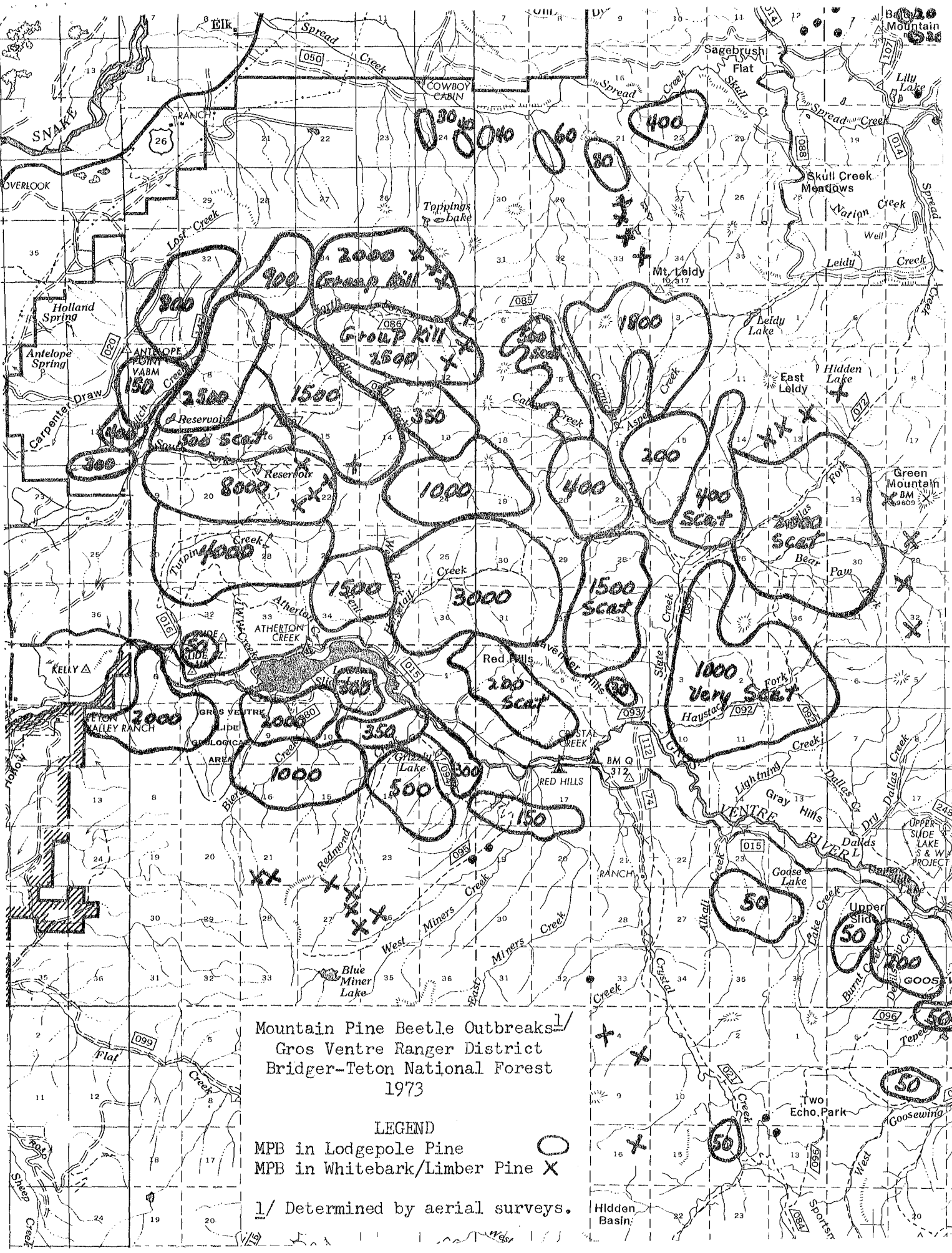
Figure 1. Distribution of attacks (by diameter) of the mountain pine beetle, Ditch Creek, Bridger-Teton National Forest, 1973.






Mountain Pine Beetle Outbreaks 1/
Gros Ventre Ranger District
Bridger-Teton National Forest
1973
LEGEND
MPB in Lodgepole Pine
MPB in Whitebark/Limber Pine X
1/ Determined by aerial surveys.
Elk
Spread Creek
Sagebrush Flat
Skull Creek Meadows
Lily Lake
Cowboy Cabin
Ranch
Snake
Overlook
Toppings Lake
Last Creek
Holland Spring
Antelope Spring
Carpenter Draw
Group Kill
Mt Leidy
Leidy Lake
East Leidy
Hidden Lake
Green Mountain
Dallas Bear Paw
Turpin Creek
Atherton Creek
Red Hills
Lavender Hills
Haystack
Crystal Creek
Lightning Creek
Gray Hills
Dry Dallas Creek
Gros Ventre River
Goose Lake
Upper Slide Lake
Grizzly Lake
Redmond Creek
West Miners Creek
East Miners Creek
Blue Miner Lake
Alkali Creek
Burnt Creek
Two Ocean Creek
Two Echo Park
Goosewing
Hidden Basin
Sheep Creek
Flat Creek
Kelly
Gros Ventre Slide
Lower Slide Lake
Upper Slide Lake S & W Project
Gros Ventre Valley Ranch
Geological Area